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EXAMINER	
CHAN, ALEX H	
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/781,461	Applicant(s) LICHTMAN ET AL.	
	Examiner Alex H Chan	Art Unit 2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 February 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-65* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-65* is/are rejected.

7)☒ Claim(s) *64 and 65* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 February 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, Fiber Bragg Grating based filter (e.g. Claim 7), Optical Band Pass Filters (e.g. Claim 8), filters constructed utilizing polarization based devices (Claim 9), active and/or passive optical components (e.g. Claims 10 and 23), DEDM (e.g. Claim 14), Coarse Division Multiplexing Techniques (e.g. Claims 15, 61 and 64), Wide Division Multiplexing Techniques (e.g. Claims 16, 62 and 65), Star configuration (e.g. Claims 18 and 50), Mesh configuration (e.g. Claims 19 and 51), point-to-point based optical network (e.g. Claims 20 and 52), Transmitter and Receiver (e.g. Claims 21 and 53), Equalizer (e.g. Claims 29 and 42), Optical Switch Mechanism (e.g. Claims 30 and 43), Switch means (e.g. Claims 32 and 45), Means for Reducing Cross-Talk (e.g. Claims 34 and 47), Gain Setting Means (e.g. Claims 35 and 48), and Optical Amplifier (e.g. Claims 36 and 53) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: optical network terminator 110 (page 14, line 32) and controller 120 (page 12, line 34). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "120" has been used to designate both MUX (Fig. 8) and Controller (page 14, line 34). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

a. There is a typographical error on page 6, lines 19 where "the a link" has been cited.

b. On page 12, line 11, "optical filter" should have been re-written as "optical filter 138."

Appropriate correction is required.

Claim Objections

5. **Claims 64 and 65** are objected to because of the following informalities: Claims 64 and 65 correspond to claims 61 and 62 which also depend on the same parent claim. However, claims 64 and 65 will be examined with merits on the basis that they depend on claim 63 instead of claim 1.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilleded in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. The limitations recited in **claims 7-10, 14-16, 18-22, 29-30, 32, 34-37, 42-43, 45, 47-48, 51-53, 61, 64-65** are merely hinted as possible modifications to present invention. However, the specification fails to provide adequate or any circuitry or structure diagrams for such hinted modifications. For example, no structures or circuitries were provided for Fiber Bragg Grating Filter, polarization based devices, DEDM, means for reducing cross-talk means, gain setting means and switching etc. Without such structure diagrams, the specification is non-enabling for a person of ordinary skill in the art.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. **Claims 1-4, 11, 17-20 and 63** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,356,386 B1 to Denkin et al (hereinafter Denkin).

Regarding claim 1, Denkin discloses a method of optical network termination (Fig. 2 and 4) in an optical network having one or more channels (e.g. WDM) each potentially corrupted with noise (e.g. nonlinear effects or power transients), said method comprising the steps of: receiving one or more input optical signals (e.g. via 201 of Fig. 2) transmitted over said one or more channels of said optical network; filtering said one or more input optical signals (e.g. via 500 of Fig. 4) so as to remove any accumulated noise (Col. 7, lines 11-14 and Col. 8, lines 16-

32): and outputting said output optical signal (e.g. via 204 of Fig. 2) onto said one or more channels on said optical network.

Regarding claims 2-4, Denkin discloses steps of demultiplexing said input optical signal into a plurality of individual optical channels, each said optical channel having a unique wavelength (Col. 4, lines 33-37); and multiplexing said plurality of individual optical channels so as to generate an output optical signal (204 of Fig. 2 and Col. 4, lines 37-41), step of demultiplexing is operative to generate a plurality of channels each corresponding to a different wavelength (Col. 4, lines 12-21), and step of multiplexing is operative to generate an optical signal from a plurality of channels each corresponding to a different wavelength (Col. 4, lines 43-46).

Regarding claim 11, Denkin discloses step of monitoring (e.g. via 426 of Fig. 4) the power level of each individual optical channel (Col. 6, line 63-Col. 7, line 14).

Regarding claims 17-20, Denkin discloses an optical network comprises an optical ring (Fig. 1), star configuration, mesh configuration, and point-to-point optical network (Col. 4, lines 5-11).

Regarding claim 63, the limitations introduced by claim 63 correspond to the limitations introduced by claim 1. The treatment of claim 1 above reads on the corresponding limitations of claim 63.

10. **Claims 21, 22, 24-25, 30-33, 36-38, 43-46 and 49** are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,549,314 B1 to Yamaguchi.

Regarding claims 21 and 24-25, Yamaguchi discloses an optical network terminator (1 of Fig. 16) for terminating an optical network comprising: a receiver (32 of Fig. 3 or receiver

inside 3-1 of Fig. 10) for receiving one or more multi-channel optical input signals (Col. 8, lines 35-37); an optical demultiplexer (34 of Fig. 3 or 3-1 of Fig. 10) operative to demultiplex each said input multi-channel optical signal into a plurality of individual optical channels, each said optical channel having a unique wavelength (Col. 8, lines 19-34); an optical multiplexer (35 of Fig. 3 or 3-2 of Fig. 10) operative to multiplex said plurality of individual optical channels so as to generate one or more output multi-channel optical signals with any accumulated noise removed (e.g. by transmitting only the transmitted signals with a predetermined threshold value, Col. 2, lines 59-64); and a transmitter (33 of Fig. 3 or transmitter inside 3-2 of Fig. 10) for outputting said one or more output multi-channel optical signals (Col. 8, lines 37-41).

Regarding claim 22, Yamaguchi discloses an optical network comprises multiple channel signals (Col. 16, lines 9-16).

Regarding claims 30 and 32, Yamaguchi discloses an optical switch mechanism (e.g. via 11 of Fig. 2) coupled to each optical channel (e.g. 11-1 of Fig. 3 is coupled to "b" of 34 of Fig. 3) between said demultiplexer (34 of Fig. 3) and said multiplexer (35 of Fig. 3), said optical switch mechanism adapted to enable and disable each individual optical channel in response to a corresponding control input (e.g. 11 of Fig. 2 can be turned off to disconnect or disable signals to travel from port 2 to port 6 and likewise, 11 of Fig. 2 can be turned on to connect or enable signals to travel from port 2 to port 6, Col. 7, lines 55-67).

Regarding claims 31 and 44, Yamaguchi discloses multi-channel optical network employs wave division multiplexing techniques (Col. 16, lines 9-16).

Regarding claims 33 and 46, Yamaguchi discloses an optical attenuator (10 of Fig. 10) placed in series with each optical channel between said demultiplexer (3-1 of Fig. 10) and said

multiplexer (3-2 of Fig. 10), said optical attenuator adapted to control the power level of the optical signal in each individual channel (Col. 18, lines 12-15).

Regarding claim 36, Yamaguchi discloses all limitations as discussed above, further discloses a plurality of nodes (Fig. 16), wherein a portion of said nodes employs one or more optical amplifiers (21 or 22 of Fig. 3); one or more optical receiving ports (e.g. via 32 of Fig. 3 or port inside 3-1 of Fig. 10 which receives 2 of Fig. 10) for receiving input single or multi-channel optical signals; one or more optical transmitting ports (e.g. via 33 of Fig. 3 or port inside 3-2 of Fig. 10 which transmits 6 of Fig. 10) adapted to output said output single or multi-channel optical signal.

Regarding claims 37-38, the limitations introduced by claims 37-38 correspond to the limitations introduced by claims 24-25, respectively. Therefore, the treatment of claims 24-25 above reads on the corresponding limitations of claims 37-38.

Regarding claims 43 and 45, the limitations introduced by claims 43 and 45 correspond to the limitations introduced by claim 30 and 32, respectively. Therefore, the treatment of claims 30 and 32 above reads on the corresponding limitations of claims 43 and 45.

Regarding claim 49, Yamaguchi discloses an optical ring network (Col. 5, lines 61-67).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skilled in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. **Claims 5-6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6,519,060 B1 to Liu.

Regarding claims 5-6, Denkin fails to teach that demultiplexing is operative to be transparent to the bit rate and protocol of each individual optical channel. Liu discloses that demultiplexing is operative to be transparent to the bit rate and protocol of each individual optical channel (e.g. λ_1 is demultiplexed via 1202 of Fig. 9 and the very same λ_1 is multiplexed via MUX of Fig. 9 without any change in wavelength (i.e. not being affected by bit-rate or protocol)). One of the ordinary skilled in the art would have been motivated to incorporate steps of demultiplexing being operative to be transparent to the bit-rate of each individual optical channel to provide an optical wavelength ad/drop multiplexer than can separate multiple channels from an input WDM to augment the channel capacity for optical communication (Col. 3, lines 31-40). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating the above steps because Liu suggest that this provides an optical wavelength ad/drop multiplexer for separating multiple channels.

13. **Claims 7, 9 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6,359,726 B1 to Onaka et al (hereinafter Onaka).

Regarding claim 7, Denkin does not disclose step of filtering comprises providing Fiber Bragg Grating based filter adapted to filter said one or re input optical signals. Onaka discloses step of filtering comprises providing Fiber Bragg Grating based filter (VGEQ11B and VGEQ12B of Fig. 6 and Col. 14, lines 21-23) adapted to filter said one or more input optical signals (Fig. 10 and Col. 2, line 1 and Col. 14, line 66-Col. 15, line 19). Accordingly, one of the

ordinary skilled in the art would have been motivated to incorporate a Fiber Bragg Grating based filter for filtering optical signals for the purpose of providing an optical communication system which achieve simultaneously wavelength flatness for both signal light gain and the noise factor for input light over a wide range of levels, to display excellent noise characteristics (Col. 3, lines 23-27). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating a Fiber Bragg Grating based filter because Onaka suggest that this provides excellent noise characteristics for input light over a wide range of levels.

Regarding claim 9, Denkin in view of Onaka discloses step of filtering comprises providing one or more filters constructed utilizing polarization based devices (Fig. 7, Onaka) and adapted to filter said one or more input optical signals (Col. 14, lines 45-65, Onaka).

Regarding claim 12, Denkin in view of Onaka discloses step of equalizing (e.g. via 3 and 4 of Fig. 1, Onaka) the gain of each individual optical channel (Col. 8, lines 15-55, Onaka).

14. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 5,986,800 to Kosaka.

Regarding claim 8, Denkin fails to disclose step of filtering comprises providing one or more Optical Band Pass Filters (OBPFs) adapted to filter said one or more input optical signals). Kosaka discloses step of filtering comprises providing one or more Optical Band Pass Filters (OBPFs) (20a-20c of Fig. 4 and Col. 19, lines 42-50) adapted to filter said one or more input optical signals (Col. 6, lines 16-26). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate one or more Optical Band Pass filters for blocking undesired wavelengths (Col. 6, lines 32-38). Therefore, it would have been obvious to one of artisan skilled

in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating optical band pass filters adapted to filter optical signals because Kosaka suggests that these filters help to block undesired wavelengths.

15. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6,466,348 B1 to Izumi.

Regarding claim 10, Denkin fails to disclose an optical network comprises any combination of active and/or passive components. Izumi discloses a combination of active and/or passive components (e.g. Fig. 5 is a structure of an ADM (passive) having no switch circuit while Fig. 6 is a structure of an ADM (active) having switch circuit, Col. 2, lines 39-57). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate an optical network comprises any combination of active and/or passive optical components such as one having switch circuit and another one having no switch circuit for adding and dropping wavelengths and providing an improved and useful trunk apparatus used in a WDM communication system (Col. 5, lines 26-29). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating combination of active and/or optical components such as an ADM having switch and no switch circuit because Izumi suggests this provide adding and dropping wavelengths which improves the trunk apparatus used in a WDM communication system.

16. **Claim 13 (as far as understood)** is rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6,262,835 B1 to Kosaka et al (hereinafter Kosaka).

Regarding claim 13, Denkin fails to teach a step of enabling and disabling each individual optical channel in response to a corresponding control input. Kosaka discloses a step of enabling and disabling each individual optical channel (e.g. via 12 of Fig. 8) in response to a corresponding control input (e.g. via 13 of Fig. 8 and Col. 17, lines 36-55). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate a step of enabling and disabling each individual optical channel in response to a corresponding control input to prevent light surge which can lead to destruction of photodetector in the optical communication end and human injury (Col. 1, lines 45-48). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating the abovementioned steps because Kosaka suggests that this can prevent light surge.

17. **Claims 14-15, 61 and 64** are rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6,344,910 B1 to Cao.

Regarding claims 14-15, Denkin fails to show the multi-channel optical network employs dense wave division multiplexing techniques. Cao discloses a multi-channel (i.e. composite optical signals) optical network employs dense wave division multiplexing (Col. 4, lines 1-13) and coarse division multiplexing techniques (Col. 4, lines 57-67). Accordingly, one of the ordinary skilled in the art would have been motivated employ a DWDM or CDWM for monitoring a composite optical signal in an optical network which is faster than the conventional performance monitors (Col. 1, lines 57-67). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of

WDM ring network of Denkin by employing DWDM or CWDM because Cao suggests that this would provide faster performance monitoring of composite optical signals.

Regarding claims 61 and 64, the limitations introduced by claims 61 and 64 correspond to the limitations introduced by claim 15. Therefore, the treatment of claim 15 above reads on the corresponding limitations of claims 61 and 64.

18. **Claims 16, 62 and 65** are rejected under 35 U.S.C. 103(a) as being unpatentable over Denkin in view of U.S. Patent No. 6321,003 B1 to Kner et al (hereinafter Kner).

Regarding claims 16, 62 and 65, Denkin fails to disclose a multi-channel optical network which employs wide division multiplexing techniques. Kner discloses a multi-channel optical network (e.g. WDM system, Col. 2, lines 37-39) which employs wide division multiplexing techniques (Col. 12, lines 24-40). Accordingly, one of the ordinary skilled in this pertinent art would have been motivated to incorporate the wide band multiplexing techniques to provide a DWDM device, sub-system, or system that is flexible and provides for different configuration, different levels of filtration as well as different combinations of wavelengths that are multiplexed and demultiplexed. Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the apparatus of WDM ring network of Denkin by incorporating wide division multiplexing techniques because Kner suggests that this provides a flexible system for different configuration.

19. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of U.S. Patent No. 6,466,348 B1 to Izumi.

Regarding claim 23, Yamaguchi fails to disclose an optical network comprises any combination of active and/or passive components. Izumi discloses a combination of active and/or

passive components (e.g. Fig. 5 is a structure of an ADM (passive) having no switch circuit while Fig. 6 is a structure of an ADM (active) having switch circuit, Col. 2, lines 39-57). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate an optical network comprises any combination of active and/or passive optical components such as one having switch circuit and another one having no switch circuit for adding and dropping wavelengths and providing an improved and useful trunk apparatus used in a WDM communication system (Col. 5, lines 26-29). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the optical control apparatus of Yamaguchi by incorporating combination of active and/or optical components such as an ADM having switch and no switch circuit because Izumi suggests this provide adding and dropping wavelengths which improves the trunk apparatus used in a WDM communication system.

20. **Claims 29, 35, 42 and 48** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of U.S. Patent No. 6,646,795 B1 to Jones et al (hereinafter Jones).

Regarding claim 29, Yamaguchi fails to disclose an equalizer coupled to each optical channel between said demultiplexer and said multiplexer, said equalizer adapted to equalize the optical gain of each individual optical channel. Jones discloses an equalizer (e.g. via filters, 8 of Fig. 1) coupled to each optical channel between said demultiplexer and said multiplexer (Col. 1, lines 24-32), said equalizer adapted to equalize the optical gain of each individual optical channel (Col. 1, line 63-Col. 2, line 10). Accordingly, one of the ordinary skilled in the art would have been motivated to employ a filter or equalizer to provide gain flatness to be controlled more accurately across group of channels (Col. 1, lines 33-35). Therefore, it would have been obvious

to one of artisan skilled in the art at the time the invention was made to have modified the optical control apparatus of Yamaguchi by incorporating an equalizer to equalizer the optical gain of each optical channel because Jones suggests that this allows gain flatness to be controlled more accurately across group of channels.

Regarding claims 35 and 48, Yamaguchi in view of Jones discloses gain setting means (e.g. via filters, 8 of Fig. 1, Jones) placed in series with each optical channel between said demultiplexer and said multiplexer, said gain setting means adapted to set the gain f each channel substantially equal to each other (Col. 2, lines 40-59 and Col. 3, lines 46-52, Jones).

Regarding claim 42, the limitations introduced by claim 42 correspond to the limitations introduced by claim 29. Therefore, the treatment of claim 29 above reads on the corresponding limitations of claim 42.

21. **Claims 26-27, 34, 39-40 and 47** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of U.S. Patent No. 6,519,060 B1 to Liu.

Regarding claims 34 and 47 (as far as understood), Yamaguchi fails to disclose means for reducing cross talk placed in series with each optical channel, said means operative to reduce the cross talk between adjacent optical channels. Liu discloses means for reducing cross talk (e.g. 407-410 of Fig. 4) placed in series with each optical channel, said means operative to reduce the cross talk between adjacent optical channels (Col. 8, lines 9-20). Accordingly, one of the ordinary skilled in the art would have been motivated to employ means for reducing cross-talk in order to provide an optical wavelength add/drop multiplexer that can separate multiple channels from an input WDM signal and selectively substitute channels from series of add ports in place of input channels (Col. 3, lines 31-35). Therefore, it would have been obvious to one of artisan

skilled in the art at the time the invention was made to have modified the optical control apparatus of Yamaguchi by incorporating means for reducing cross-talk because Liu, from the same field of endeavor, suggests that this provides a WDM add/drop multiplexer than can separate multiple channels in place of input channels.

Regarding claims 26-27, Denkin in view of Liu discloses that demultiplexing is operative to be transparent to the bit rate and protocol of each individual optical channel (e.g. λ_1 is demultiplexed via 1202 of Fig. 9 and the very same λ_1 is multiplexed via MUX of Fig. 9 without any change in wavelength (i.e. not being affected by bit-rate or protocol), Liu).

Regarding claims 39-40, the limitations introduced by claims 39-40 correspond to the limitations introduced by claims 26-27. Therefore, the treatment of claims 26-27 above reads on the corresponding limitations of claims 39-40.

22. **Claims 28, 41, 53, 58 and 60** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of U.S. Patent No. 6,594,046 B1 to Nishino.

Regarding claims 53 and 28, Yamaguchi discloses all limitations as discussed in claims 21 and 36, but fails to disclose a plurality of optical attenuators, each optical attenuator coupled in-line to an individual optical channel, said optical attenuator operative to very the optical gain of an optical signal and a plurality of monitors, each monitor coupled in line to an individual optical channel, said monitor operative to measure the optical power of an optical signal. Nishino discloses a plurality of optical attenuators (121 and 122 of Fig. 1A), each optical attenuator coupled in-line to an individual optical channel (e.g. 121 is coupled with λ_1 while 122 is coupled with λ_2), said optical attenuator operative to very the optical gain of an optical signal (e.g. via 211 of Fig. 1B and Col. 3, lines 50-54) and a plurality of monitors (171 of Fig. 1A), each monitor

coupled in line to an individual optical channel (e.g. 171 is coupled to each λ_1, λ_2... λ_n), said monitor operative to measure the optical power of an optical signal (Col. 1, line 66-Col. 2, line 2 and lines 53-57 and Col. 3, lines 22-32). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate a plurality of optical attenuators and monitors so that the powers of the WDM signals are maintained at a constant level throughout the whole wavelengths (Col. 1, lines 29-31). Therefore, it would have been obvious to one of artisan in the pertinent art at the time the invention was made to have modified the optical control apparatus of Yamaguchi by incorporating the above means because Nishino, from the same field of endeavor, suggests that this would provide the powers of WDM signals a constant level throughout their transmission.

Regarding claim 41, the limitations introduced by claim 41 correspond to the limitations introduced by claim 28. Therefore, the treatment of claim 28 above reads on the corresponding limitations of claim 41.

Regarding claim 58, Yamaguchi in view of Nishino discloses all limitations as disclosed above, further discloses providing remote enabling/disabling (e.g. via 11 of Fig. 2, Yamaguchi) of individual optical channel (e.g. 11 of Fig. 2 can be turned off to disable signals to travel from port 2 to port 6 and likewise, 11 of Fig. 2 can be turned on to enable signals to travel from port 2 to port 6, Col. 7, lines 55-67, Yamaguchi).

Regarding claim 60, Yamaguchi in view of Nishino discloses all limitations as discussed above, and further discloses said optical ring terminator is adapted to enable in-line monitoring (e.g. via 171 of Fig. 1A, Nishino) of power level of said plurality of optical signals (Col. 1, line 66-Col. 2, line 2 and lines 53-57 and Col. 3, lines 22-32, Nishino).

23. **Claims 50-52** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Denkin.

Regarding claims 50-52, Yamaguchi fails to disclose an optical network comprising a star, mesh or point-to-point based configuration. Denkin discloses an optical network comprises star configuration, mesh configuration, and point-to-point configuration (Col. 4, lines 5-11). Accordingly, one of the ordinary skilled in the art would have been motivated to incorporate optical network comprises star configuration, mesh configuration, and point-to-point configuration in order to meet the increasing demands for more bandwidth and high data rates in those network topologies which those skilleded in the art will understand (Col. 1, lines 18-19 and Col. 4, lines 2-3). Therefore, it would have been obvious to one of artisan in the pertinent art at the time the invention was made to have modified the optical control apparatus of Yamaguchi by incorporating the above star configuration, mesh configuration, and point-to-point configuration because Denkin suggests that his invention can also be applied to these configuration for meeting their needs of bandwidth and data rates.

24. **Claims 54-55** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Nishino as applied to claim 53 above, and further in view of Liu.

Regarding claims 54-55, Yamaguchi in view of Nishino fails to disclose optical demultiplexer is operative to generate eight channels corresponding to eight different wavelengths and multiplexer is operative to generate eight channels corresponding to eight different wavelengths. Liu discloses optical demultiplexer (combination of 305 and 307 of Fig. 4) is operative to generate eight channels corresponding to eight different wavelengths (Col. 7, lines 48-58) and multiplexer (combination of 407 and 405 of Fig. 4) is operative to generate

eight channels corresponding to eight different wavelengths (Col. 8, lines 15-20). Also, since the input is a WDM signal employing signals consisting of a number of different wavelength optical signals (Col. 1, lines 41-43), it would have been a matter of design choice to generate eight different wavelengths. This support rational is based on a recognition that the claimed differences exist not as a result of an attempt by applicant to solve a problem but merely amounts to selection of expedient known to the artisan of ordinary skill as design choice.

25. **Claims 56-57** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Nishino as applied to claim 53 above, and further in view of U.S. Patent No. 6,519,060 B1 to Liu.

Regarding claims 56-57, Yamaguchi in view of Nishino fails to teach that the optical ring terminator is adapted to be transparent to the bit rate and protocol of each individual optical channel. Liu discloses that the optical ring terminator (e.g. Fig. 4) is adapted to be transparent to the bit rate and protocol of each individual optical channel (e.g. λ_1 is demultiplexed via 1202 of Fig. 9 and the very same λ_1 is multiplexed via MUX of Fig. 9 without any change in wavelength (i.e. not being affected by bit-rate or protocol)). One of the ordinary skilled in the art would have been motivated to incorporate steps of demultiplexing being operative to be transparent to the bit-rate of each individual optical channel to provide an optical wavelength ad/drop multiplexer than can separate multiple channels from an input WDM to augment the channel capacity for optical communication (Col. 3, lines 31-40). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the optical control apparatus of Yamaguchi in view of Nishino by incorporating the above steps because Liu

suggest that this provides an optical wavelength ad/drop multiplexer for separating multiple channels.

26. **Claim 59** is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguchi in view of Nishino as discussed in claim 53 above, and further in view of Jones.

Regarding claim 59, Yamaguchi in view of Nishino fails to disclose said optical ring terminator is adapted to enable the gain equalization of said plurality of optical channels. Jones discloses optical ring terminator (Fig. 1 or 100a of Fig. 11) is adapted to enable the gain equalization (e.g. via filters, 8 of Fig. 1) of said plurality of optical channels (Col. 1, line 63-Col. 2, line 10). Accordingly, one of the ordinary skilled in the art would have been motivated to employ a filter or equalizer to provide gain flatness to be controlled more accurately across group of channels (Col. 1, lines 33-35). Therefore, it would have been obvious to one of artisan skilled in the art at the time the invention was made to have modified the optical control apparatus of Yamaguchi in view of Nishino by incorporating an equalizer to equalizer the optical gain of each optical channel because Jones suggests that this allows gain flatness to be controlled more accurately across group of channels.

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sugaya et al is cited to show demultipelxing and multiplexing optical amplifer (termintor) having equalization method (Col. 4, lines 51-55). Kosaka et al (6,580,550) is cited to show optical filters and monitors for controlling optical power. Nagatsu is cited to show another ADM circuit in an optical communication (Fig. 5-6, 14-15). Kosaka (6,262,835) is cited to demonstrate an optical switch (Fig. 8) and a controller or monitor for controlling optical gain

and power (Fig. 30, 34, and 37). Naganuma is cited to show active and passive optical component/network (Col. 12, lines 19-26). Hayashi et al is cited to show gain controlling (Fig. 3). Chang-Hasnain is cited to show a DWDM, coarse and wide division multiplexing system (Col. 4, lines 37-42). Onaka et al (6,067,187) is cited to show a multiplexer (Fig. 16) and demultiplexer (Fig. 17) having power controlling means (37 of Fig. 7). Askinger et al is cited to show related work in optical terminator (Fig. 1-4). Terahara et al is cited to show variable filters in a mux/demux amplifier having control circuit for controlling power (Fig. 12). Sugaya is cited to show gain equalization (Fig. 18, 22-23). Kosaka (6,094,296) is cited to show similar optical terminator (Fig. 8).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alex H Chan whose telephone number is (703) 305-0340. The examiner can normally be reached on Monday to Friday (8am to 6pm EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703) 305-4729. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

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